National Institute of Environmental Health Sciences

Ambient air pollution and cardiovascular emergency department visits in potentially sensitive groups

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Abstract:

Limited evidence suggests that persons with conditions such as diabetes, hypertension, congestive heart failure, and respiratory conditions may be at increased risk of adverse cardiovascular morbidity and mortality associated with ambient air pollution. The authors collected data on over 4 million emergency department visits from 31 hospitals in Atlanta, Georgia, between January 1993 and August 2000. Visits for cardiovascular disease were examined in relation to levels of ambient pollutants by use of a case-crossover framework. Heterogeneity of risk was examined for several comorbid conditions. The results included evidence of stronger associations of dysrhythmia and congestive heart failure visits with comorbid hypertension in relation to increased air pollution levels compared with visits without comorbid hypertension; similar evidence of effect modification by diabetes and chronic obstructive pulmonary disease (COPD) was observed for dysrhythmia and peripheral and cerebrovascular disease visits, respectively. Evidence of effect modification by comorbid hypertension and diabetes was observed in relation to particulate matter less than 10 microm in aerodynamic diameter, nitrogen dioxide, and carbon monoxide, while evidence of effect modification by comorbid COPD was also observed in response to ozone levels. These findings provide further evidence of increased susceptibility to adverse cardiovascular events associated with ambient air pollution among persons with hypertension, diabetes, and COPD.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Meteorological Factors, Temperature

Air Pollution: Ozone, Particulate Matter, Other Air Pollution

Air Pollution (other): CO;NO2

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location: ☒

resource focuses on specific location

United States

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Diabetes/Obesity, Respiratory Effect

Cardiovascular Effect: Heart Attack, Other Cardiovascular Effect

Cardiovascular Disease (other): dysrhythmia; heart failure; cerebrovascular disease; hypertension

Respiratory Effect: Asthma, Bronchitis/Pneumonia, Chronic Obstructive Pulmonary Disease, Upper Respiratory Allergy

Resource Type: ☒

format or standard characteristic of resource

Research Article

Timescale: ☒

time period studied

Time Scale Unspecified